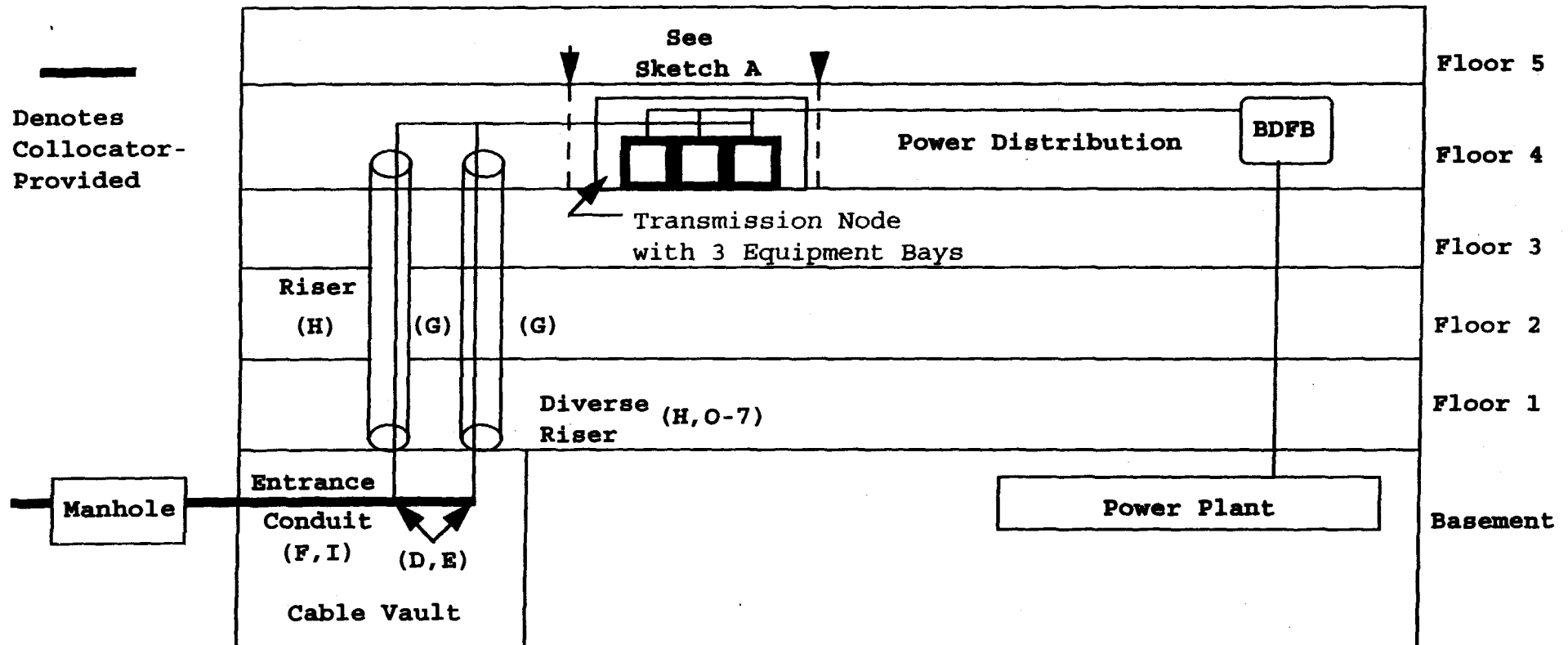


ATTACHMENT H

Physical Collocation

(Illustrative Example)

Central Office (ACOI)



Applicable Rate Elements - See Descriptions

- (D) Cable vault Splicing
- (E) Splice testing
- (F) Cable Pulling - Manhole to Cable Vault
- (G) Cable Pulling - Cable Vault to Node

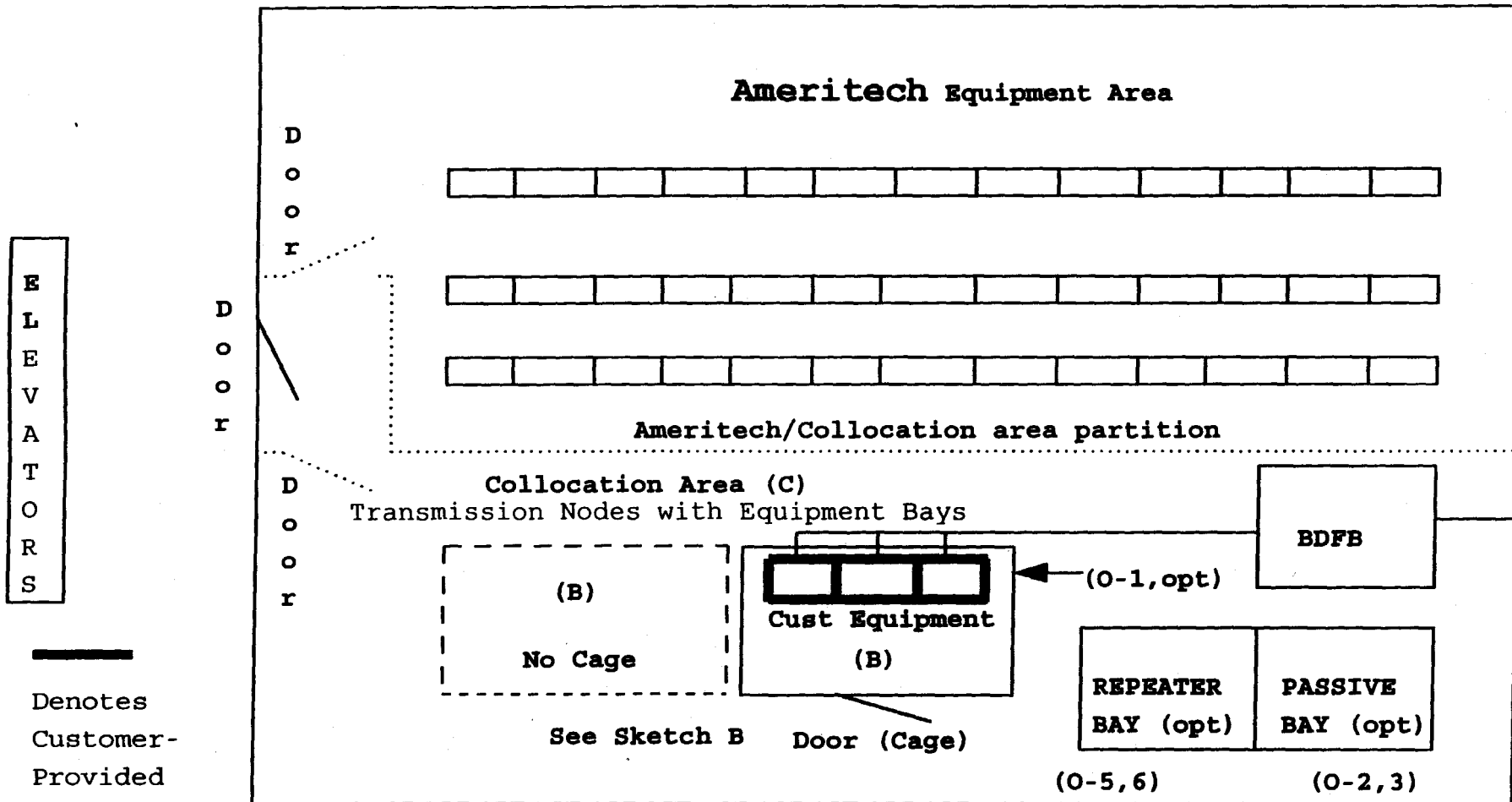
- (H) Riser Space/ft
- (I) Entrance Conduit
- (O-7) Diverse Riser (Optional)

Sketch A - ACOI

Floor 4

(For illustration only)

Restrooms



Applicable Rate Elements - See Descriptions

STAIRWELL

(B) Central Office Floor Space

(C) Central Office Build Out (COBO)

(0-1) Transmission Node Enclosure (Optional)

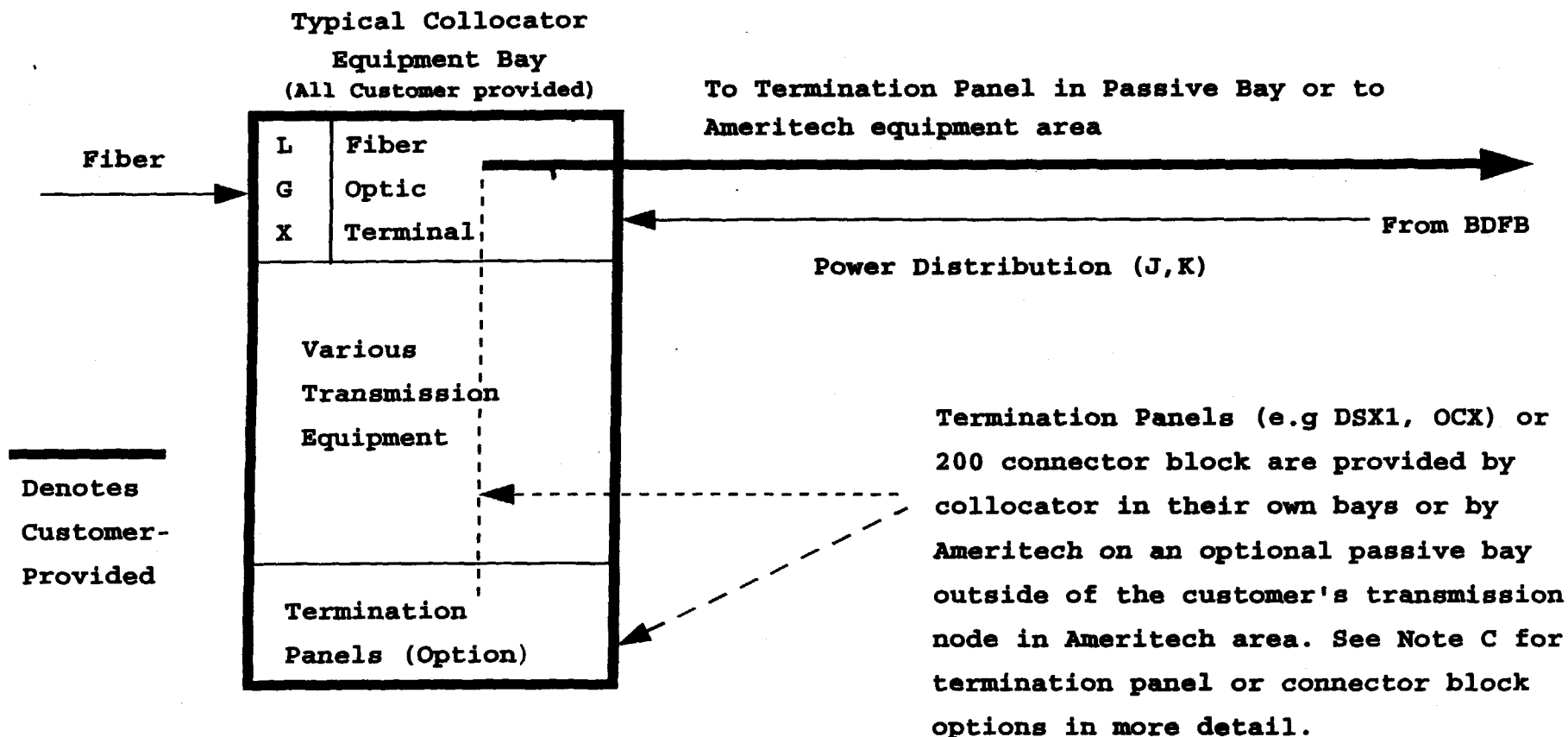
(0-2,3) Passive Bay Term (Optional)

(0-5,6) DS1/DS3 Repeater (Optional)

Collocator Equipment Bay

Sketch B

(for illustration only)



Applicable Rate Elements - See Descriptions

(J) Power Consumption / Fuse Amp

(K) Power Delivery / Power lead

Termination Panel options

Note C

1. Customer equipment output is connected to a cross-connection panel (e.g. DSX1/DSX3/OCX) or 200 conductor cross-connection block in Ameritech equipment area for cross-connection to Ameritech termination panel or 200 conductor block to which Ameritech services are connected. The collocater does not have a test point in this arrangement.
2. Customer equipment output is connected to customer-provided termination panel or 200 conductor block mounted in customer's equipment bay within the customer's node. The customer connects their customer-provided termination panel or conductor block within their transmission node to an Ameritech-provided cross-connection panel or 200 conductor cross-connection block provided in the Ameritech equipment area for cross-connection to Ameritech termination panel or conductor block to which Ameritech services are connected. The collocater has a test point in this arrangement.
3. Customer equipment output is connected to the Ameritech-provided termination panel or 200 conductor termination block in the optional Ameritech-provided passive bay outside of the customer's transmission node. The customer connects the passive bay to the Ameritech-provided cross-connection panel or 200 conductor cross-connection block in Ameritech equipment area for cross-connection to an Ameritech termination panel or conductor block to which Ameritech services are connected. The collocater has a test point outside their node but still in collocation area.

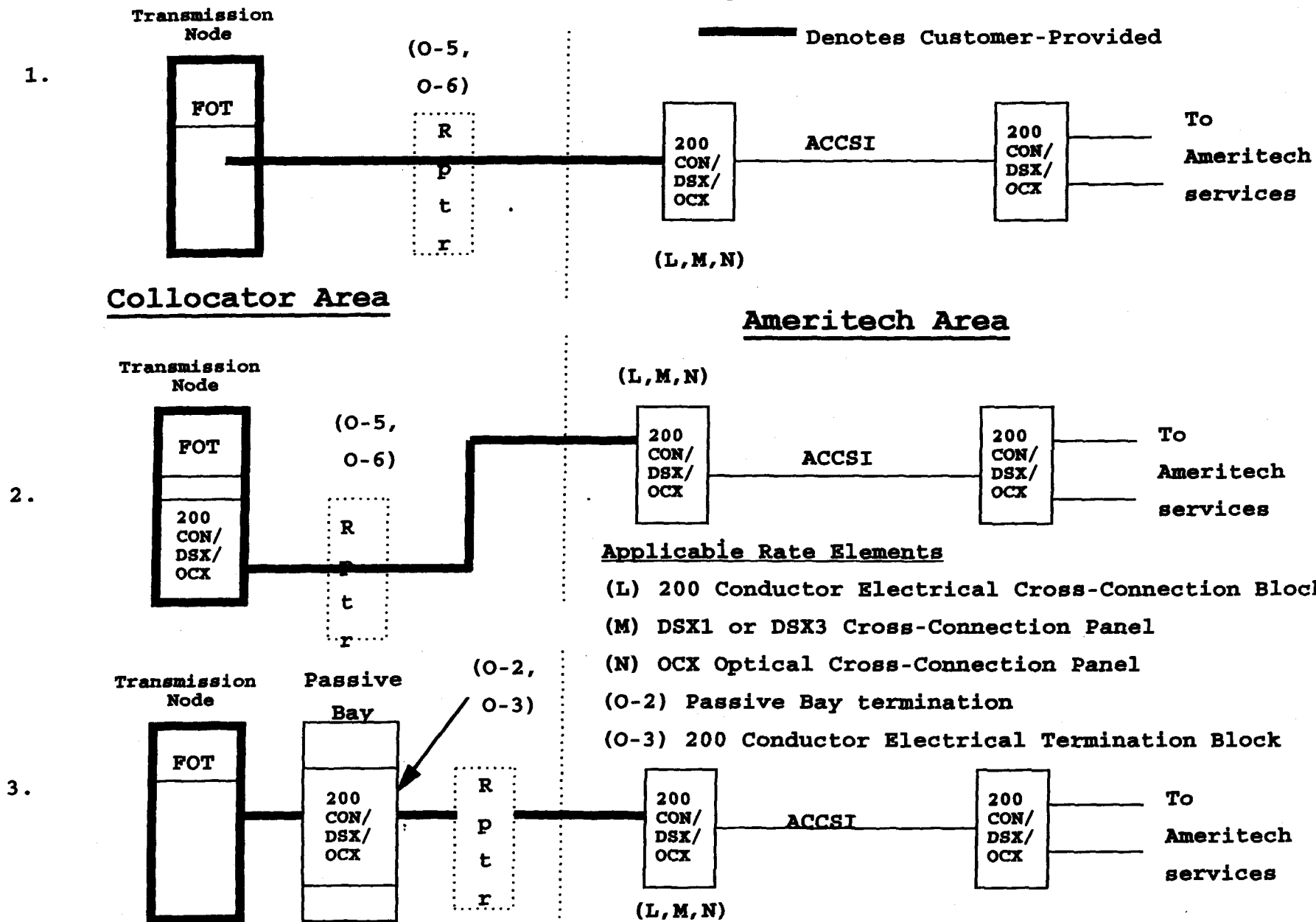
See Sketch D for examples of 1, 2, and 3.

Note: Repeaters are optional dependent on distance from collocation area to Ameritech-provided cross-connection panels in the Ameritech area.

Termination Panel (DSX/OCX) / 200 Conductor Block Options

Sketch D

(For illustration only)



Ameritech Central Office Interconnection
Rate Element Description

(A) Order Charge - Per Order

The Order Charge rate category provides for the processing of the ACOI application associated with a request for Central Office Floor Space within each Central Office and, provides for preliminary work needed to determine if the Central Office Floor Space requested in the customer's ACOI application is available. This charge is not dependent upon the amount of floor space requested. The Order Charge will be applied once per ACOI and includes different aspects of processing of the ACOI application performed by the collocation coordinator, Common System Planning Engineering Center (CSPEC) engineer, real-estate coordinator, service representative and account manager.

(B) Central Office Floor Space - Per 100 Sq. Ft.

The Central Office Floor Space rate category provides for nominal 100 square foot increments of floor space located in the Central Office equipment areas in Telephone Company designated Central Offices used and occupied by the customer for ACOI. The Central Office Floor Space rate will include the associated environmental supports such as heating, AC power and air conditioning equivalent to the Central Office equipment environment at that location.

(C) Central Office Build Out - Per First 100 Sq. Ft of Floor Space Requested and Per Additional 100 Sq. Ft of Floor Space Requested

The Central Office Build Out (COBO) provides for modifications or additions that must be made to the Central Office to accommodate a customer's Transmission Node. These modifications include security devices, additions to and distribution of heating, ventilation and air conditioning, AC power circuit, and necessary space modifications. Included are the required capital costs and operating expenses for installing walls and doors, locks and keys, reconditioning of floors, overhead lighting, the provisioning of AC power in the customer's space. The initial 100 sq. ft COBO charge provides for the design, engineering and COBO work required to prepare the initial nominal 100 sq. ft of Central Office Floor Space ordered. The additional 100 sq. ft. COBO charge provides for the COBO work required to prepare each additional contiguous 100 sq. ft. of Central Office Floor Space requested.

(D) Cable Vault Splicing - Per Initial Splice and Per Subsequent Splice

The Cable Vault Splicing rate category provides for splicing customer provided outside plant (OSP) fiber optic cable to customer provided riser cable and Telephone Company approved cable in the Central Office cable vault. This rate category is charged in two rate elements, Per Initial Fiber Splice and Per Subsequent Fiber Splice. The initial splice includes the average length of time it takes to set up the splicing site, prepare the sheath and inner case, prepare the splicing unit, and do the actual splice. The additional splice reflects the technician's time to perform an individual splice. A separate Initial Fiber Splice charge will be charged each day that splicing occurs.

(E) Splice Testing - Per Initial Splice Test and Per Subsequent Splice Test

The Splice Testing rate category provides for testing the splice loss associated with each fiber strand spliced in the Telephone Company cable vault. Splice Testing is charged in two rate elements, per Initial Splice Tested and Per Subsequent Splice Tested and is a nonrecurring charge. A separate Initial Splice Test Charge will be charged each day that splice testing occurs. The initial splice includes the time taken to prepare the site, as well as do the actual test. The additional splice test reflects the technician's time to perform a single splice test.

Ameritech Central Office Interconnection
Rate Element Description

(F) Cable Pulling form the Manhole to the Cable Vault - Per First Foot and Per Additional Foot

The Cable Pulling from Manhole to Cable Vault rate category provides for a technician to pull the customer provided fiber optic cable from the meetpoint in a designated manhole outside the ACOI Central Office to the Central Office cable vault. This rate category is provided on a per initial and additional foot basis, and is a nonrecurring charge. It reflects the time it takes to pull the first foot, and each subsequent foot of cable. Included in the initial foot is the time required to prepare the conduit and remove standing water form the manhole.

(G) Cable Pulling form the Cable Vault to the Transmission Node - Per First Foot and Per Additional Foot

The Cable Pulling from Cable Vault to the Transmission Node rate category provides for the a technician to pull the customer provided fiber optic riser cable from the Central Office cable vault to the customer's Transmission Node. This rate category is provided on a per initial and additional foot basis.

(H) Riser Space - Per Foot

The Riser Space rate category provides for the customer's use of the space and any supporting structures on which the customer's fiber optic riser cable resides, between the Central Office cable vault and the customer's Transmission Node and the fiber optic racking within the Central Office.

(I) Entrance Conduit - Per Inner Duct, Per Foot

Entrance Conduit facilities provide for the customer's use of conduit duct space between the designated manhole and the Telephone Company cable vault. The rate applies per foot of innerduct provided. The cost of conduit is based on the conduit investment, as well as the contractor's costs for the building of new conduit innerducts.

(J) Power Consumption - Per Fuse Amp

The Power Consumption rate category provides for 48 Volt DC Power to be delivered to the Transmission Node. This rate element is designed to recover the cost of the power consumed by the customer. This rate is applied per Fuse Amp ordered and is a monthly recurring rate.

(K) Power Delivery - Per Power Lead

Power Delivery provides for delivery of Telephone Company DC power to one 7' Equipment Bay within the customer's Transmission Node. A separate DC Power Delivery connection to the DC Power System is required for each 7' Equipment Bay within the Transmission Node. Power Deliver includes a portion of the Battery Distribution Fuse Board (BDFB), cabling from the BDFB to the Transmission Node and fuses. The Power Delivery nonrecurring rate is applied once per power. Each 7' equipment bay may be equipped with up to two power leads.

(L) 200 Conductor Electrical Cross-Connection Block - Per Cross-Connect Block

The 200 Conductor Cross-Connection Block provides a termination block with a termination field for Telegraph Grade, Voice Grade, Direct Analog or Ameritech Base Rate (2.4, 4.8, 9.6, 56.0 and 64 Kbps) digital derived channels. Each 200 Conductor Electrical Cross-Connection Block includes the 200 conductor cross-connection block at the main distribution frame (MDF) plus a portion of the MDF superstructure.

Ameritech Central Office Interconnection
Rate Element Description

(M) Digital Cross-Connection Panel

- Per DSX-1 Panel (Up to 56 DS1 Terminations)

The Digital Cross-Connection Panel (DSX) per DSX-1 provides a termination field for 56 DS-1 or LT1 derived channels. This includes the DSX-1 panel and the terminations on the panel for up to 56 DS-1 terminations.

- Per DSX-3 Termination

The Digital Cross-Connection Panel (DSX) per DSX-3 termination provides a termination field for DS-3 or LT3 derived channels. This includes the a portion of the DSX-3 panel and the terminations on the DSX-3 panel. The investment was apportioned assumed a fully utilized panel. For each DS-3 channel requested in the OLT System configuration, one DSX-3 termination is required.

(N) Optical Cross-Connection Panel - Per OCX Panel Segment

The Optical Cross-Connection Panel (OCX) provides a termination field for OC3, OC12 or OC48 derived channels. For each OC-n channel requested in the OLT System configuration, one OC-n termination is required of the same type. The OCX panel is configured in 3 segments with each segment providing a maximum of 24 terminations. The Optical Cross Connection Panel rate includes one segment of an OCX panel.

(O-1) Transmission Node Enclosure - Per First 100 Sq. Ft. Enclosed and Per Additional 100 Sq. Ft. Enclosed (Optional)

This rate provides for a lockable 8' high wire mesh perimeter security fence with gate to be placed around the customer's Transmission Node. The initial Transmission Node Enclosure charge applies for the first 100 sq. ft. of Central Office Floor Space enclosed. The additional Transmission Node Enclosure applies for enclosing each additional 100 sq. ft. of Central Office Floor Space that is contiguous with the initial 100 sq. ft. of floor space and does not include a gate or any additional engineering. The most current cost support for this rate element is displayed in FCC Transmittal No. 996, Exhibit 2, pages 3 and 4.

(O-2a) Passive Bay Termination - Per DS-1 Termination (Optional)

The Passive Bay DS-1 termination provides a portion of the DSX-1 Equipment Bay, DSX-1 Termination Panel and the DSX-1 termination on the panel associated with one DS-1 termination.

(O-2b) Passive Bay Termination - Per DS-3 Termination (Optional)

The Passive Bay DS-3 termination provides a portion of the DSX-3 Equipment Bay, DSX-3 Termination Panel and the DSX-3 termination on the panel associated with one DS-3 termination. The facilities were apportioned assuming a fully equipped equipment bay and a fully utilized DSX-3 panel.

(O-3) 200 Conductor Electrical Termination Block - Per Termination Block (Optional)

The 200 Conductor Electrical Termination Block rate element provides for a 200 conductor electrical termination block outside the customer's transmission node plus the mounting of the termination block.

Ameritech Central Office Interconnection
Rate Element Description

(O-5) DS-1 Repeater - Per DS1 Repeater (Optional)

DS-1 Repeater facilities include the portion of the DS-1 Repeater Bay and DS-1 Repeater Panel associated with one DS-1 circuit and the Repeater itself.

(O-6) DS-3 Repeater - Per DS3 Repeater (Optional)

DS-3 Repeater facilities include the portion of the DS-3 Repeater Bay and DS-3 Repeater Panel associated with one DS-3 circuit and the Repeater itself.

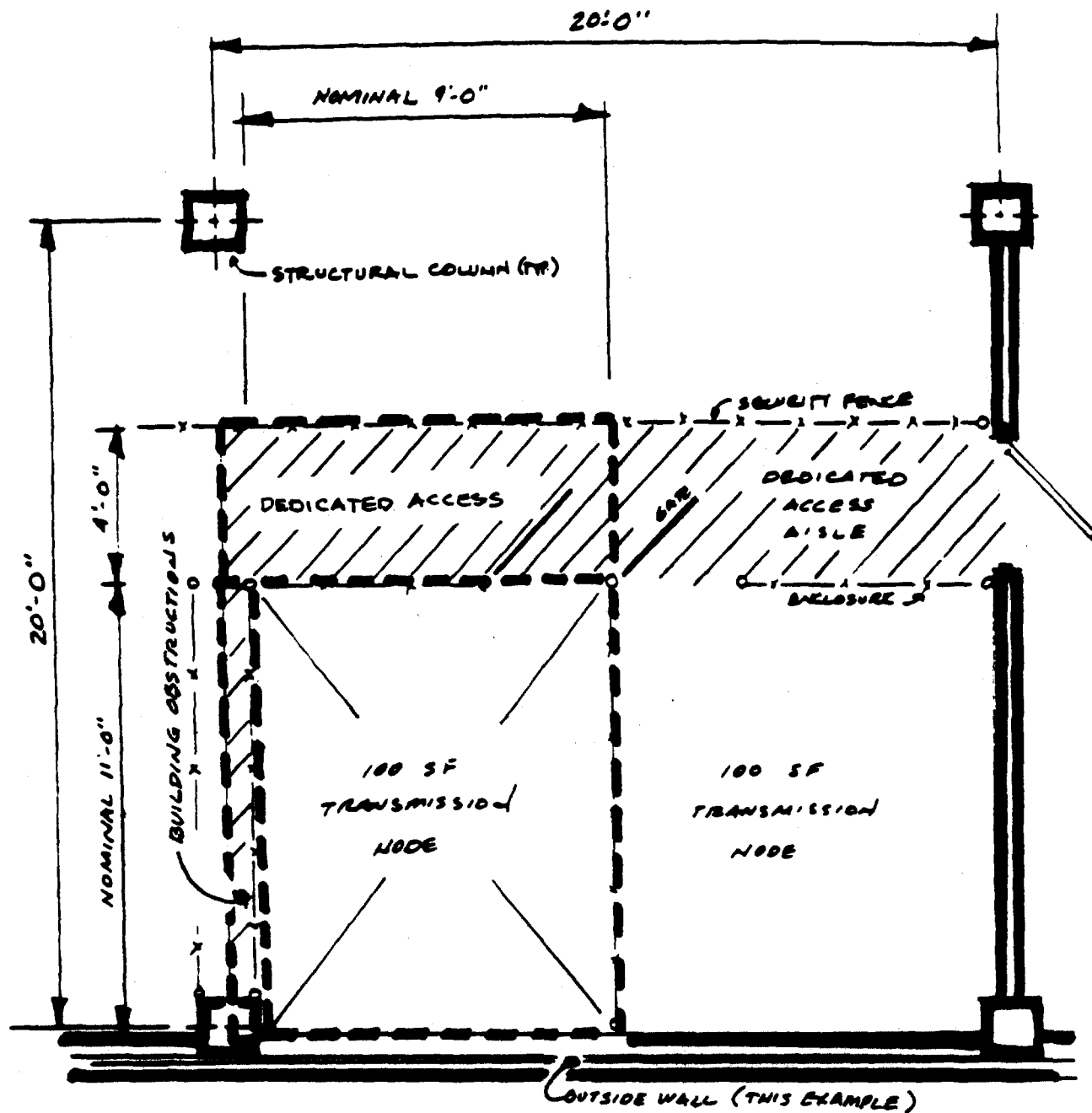
(O-7) Diverse Riser - Per Floor Traversed (Optional)

The investment for Diverse River consists of capital material, engineering and labor required to bore a hole through the floor, place a metal conduit sleeve secured with collars in the hole, and seal the sleeve with fire retardant putty.

(Q) Space Reservation Charge - Per Reservation Request (Optional)

The Space Reservation Charge rate category provides for the processing and maintenance of the customer's space reservation for Central Office Floor Space. The Space Reservation Charge is a nonrecurring charge applied once per Central Office per reservation request.

ATTACHMENT I



Proposed 100 SF
Transmission Node
Configuration

Scale 1/4" = 1'-0"

ATTACHMENT J

Credits

This report and the survey on which it is based were developed under the leadership of the IFMA research committee and IFMA research department.

1994 Research Committee Members

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- C. Rick Anderson
- Stephen Bell, CFM
- Stormy Friday
- James E. Loesch
- Ira A. Marcus, CFM
- Jaan Meri, CFM
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Benchmarks II

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R e s e a r c h R e p o

ARKS II

International Facility Management

GROSS, RENTABLE AND USABLE BY INDUSTRY TYPE AND FACILITY USE

The following tables show the mean gross, rentable and usable area of the sample facilities according to industry type and facility use.

Industry Type	Means			
	N	Gross Sq. Ft.	Rentable Sq. Ft.	Usable Sq. Ft.
Financial	58	639,864	378,023	300,894
Health/Hotel	8	252,928	221,138	204,166
Utilities	33	419,668	320,518	236,028
Wholesale/Retail	8	372,997	315,732	306,854
Other Services	13	373,554	318,466	279,207
Chemicals	9	628,658	465,242	437,537
Computers	37	902,541	849,186	700,227
Consumer Products	18	350,294	338,786	290,659
Energy/Mining	16	787,187	647,820	503,843
Motor Vehicles	11	1,550,082	1,376,382	1,166,022
Other Manufacturing	22	689,711	642,967	598,959
Educational	11	267,085	246,926	171,430
Governmental	25	655,308	562,158	498,355
Research	8	344,668	322,049	255,420

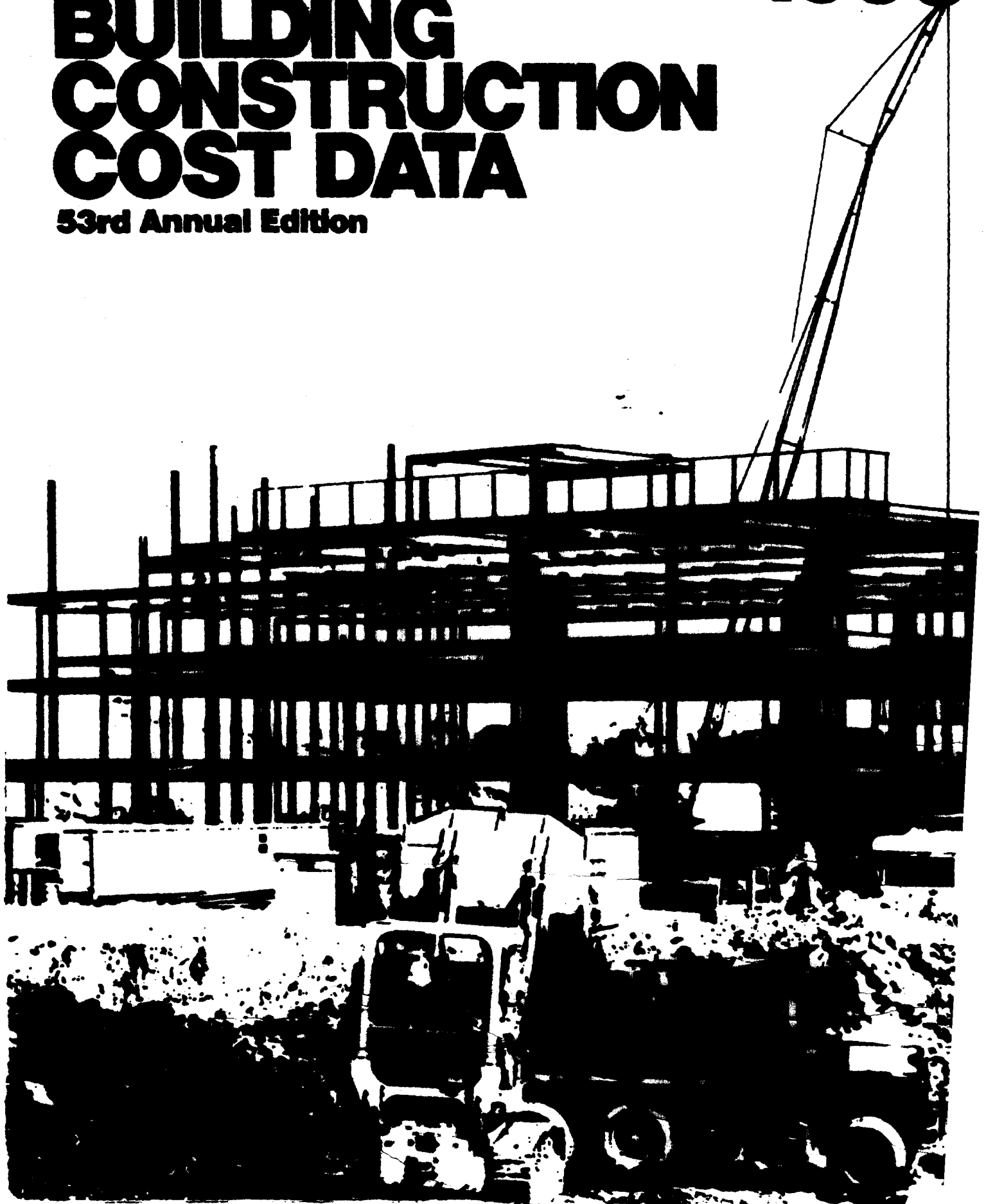
Facility Use	Means			
	N	Gross Sq. Ft.	Rentable Sq. Ft.	Usable Sq. Ft.
Multi-Usage	87	795,447	708,289	646,924
Headquarters	108	544,055	379,829	353,092
Other Offices	24	251,053	228,944	190,244
Customer Service	10	127,062	121,133	96,182
Education/Training	5	324,634	259,320	178,365
Research	20	705,592	614,032	475,080
Factory/Plant	17	1,077,109	1,073,041	926,980
Health Care	3	285,944	224,767	149,019

ATTACHMENT K

MEANS BUILDING CONSTRUCTION COST DATA

53rd Annual Edition

1995



FOREWORD

Our Mission

Since 1942, R.S. Means Company, Inc. has been actively engaged in construction cost publishing and consulting throughout North America.

Today, over fifty years after the company began, our primary objective remains the same: to provide you, the construction industry professional, with the most current and comprehensive construction cost data possible.

Whether you are a contractor, an owner, an architect, an engineer, a facilities manager, or anyone else who needs a quick construction cost estimate, you'll find this publication to be a highly useful and necessary tool.

Today, with the constant flow of new construction methods and materials, it's difficult to find the time to look at and evaluate all the different construction cost possibilities. In addition, because labor and material costs keep changing, yesterday's cost information is not a reliable basis for today's estimate or budget.

That's why so many construction professionals turn to R.S. Means. We keep track of the costs for you along with a wide range of other key information, from city cost indexes . . . to productivity rates . . . to crew composition . . . to contractor's overhead and profit rates.

R.S. Means performs these functions by analyzing all facets of the industry. Data is collected and organized into a format that makes the cost information instantly accessible to you. From the preliminary budget to the detailed unit price estimate, you'll find that the data in this book is useful for all phases of construction cost determination.

The Staff, the Organization, and Our Services

When you purchase one of R.S. Means' publications, you are in effect hiring the services of a full-time staff of construction and engineering professionals.

A thoroughly experienced and highly qualified staff of professionals at R.S. Means works daily at collecting, analyzing, and disseminating comprehensive cost information for your needs. These staff members have years of practical construction experience and engineering training prior to joining the firm. As a result, you can count on them not only for the cost figures, but also for additional background reference information that will help you create a realistic estimate.

The Means organization is always prepared to assist you and help in the solution of construction problems through the services of its four major divisions: Construction and Cost Data Publishing, Electronic Products and Services, Consulting Services, and Educational Services.

Besides a full array of construction cost estimating books, Means also publishes a number of other reference works for the construction industry. Subjects include building automation, HVAC, roofing, plumbing, fire protection, hazardous materials and hazardous waste, business, project, and facilities management and many more.

In addition, you can access all of our construction cost data through your computer. For instance, MeansData™ for Spreadsheets is an electronic tool that lets you access over 40,000 lines of Means construction cost data right at your PC.

What's more, you can increase your knowledge and improve your construction estimating and management performance with a Means Construction Seminar or In-House Training Program. These two-day seminar programs offer unparalleled opportunities for everyone in your organization to get updated on a wide variety of construction related issues.

In short, R.S. Means can put the tools in your hands for constructing accurate and dependable construction estimates and budgets in a variety of ways.

Robert Snow Means Established a Tradition of Quality That Continues Today

Robert Snow Means took years to build up his company. He worked hard and always made certain that he delivered a quality product.

Today, at R.S. Means, we do more than talk about the quality of our data and the usefulness of our books. We stand behind all of our work, from historical cost indexes to construction techniques to current costs.

If you have any questions about our products or services, please call us toll-free at 1-800-448-8182. Our customer service representatives will be happy to assist you . . . as they would have over fifty years ago.

HOW THE BOOK IS BUILT: AN OVERVIEW

A Powerful Construction Tool

You have in your hands one of the most powerful construction tools available today. A successful project is built on the foundation of an accurate and dependable estimate. This book will enable you to construct just such an estimate.

For the casual user the book is designed to be:

- quickly and easily understood so you can get right to your estimate
- filled with valuable information so you can understand the necessary factors that go into the cost estimate

For the regular user, the book is designed to be:

- a handy desk reference that can be quickly referred to for key costs
- a comprehensive, fully reliable source of current construction costs and productivity rates, so you'll be prepared to estimate any project
- a source book for preliminary project cost, product selections, and alternate materials and methods

To meet all of these requirements we have organized the book into the following clearly defined sections.

Quick Start

This one-page section (see following page) can quickly get you started on your estimate.

How To Use the Book: The Details

This section contains an in-depth explanation of how the book is arranged . . . and how you can use it to determine a reliable construction cost estimate. It includes information about how we develop our cost figures and how to completely prepare your estimate.

Unit Price Section

All cost data has been divided into the 16 divisions according to the MasterFormat system of classification and numbering as developed by the Construction Specifications Institute (CSI) and Construction Specifications Canada (CSC). For a listing of these divisions and an outline of their subdivisions, see the Unit Price Section Table of Contents.

Division 17: Quick Project Estimates:

In addition to the 16 Unit Price Divisions there is a S.F. (Square Foot) and C.F. (Cubic Foot) Cost Division, Division 17. It contains costs for 59 different building types. You can refer to this section to make a rough — and very quick — estimate for the overall cost of a project or its major components.

Reference Section

This section includes information on Reference Numbers, Change Orders, Crew Listings, Historical Cost Indexes, City Cost Indexes, and a listing of Abbreviations.

Reference Numbers: At the beginning of selected major classifications in the Unit Price Section are "reference numbers" shown in bold squares. These numbers refer you to related information in the Reference Section.

In this section, you'll find reference tables, explanations, and estimating information that support how we develop the unit price data. Also included are alternate pricing methods, technical data, and estimating procedures, along with information on design and economy in construction. You'll also find helpful tips on what to expect and what to avoid when estimating and constructing your project.

It is recommended that you refer to the Reference Section if a "reference number" appears within the major classification you are estimating.

Change Orders: This section includes information on the factors that influence the pricing of change orders.

Crew Listings: This section lists all the crews referenced in the book. For the purposes of this book, a crew is composed of more than one trade classification and/or the addition of power equipment to any trade classification. Power equipment is included in the cost of the crew. Costs are shown both with bare labor rates and with the installing contractor's overhead and profit added. For each, the total crew cost per eight-hour day and the composite cost per man-hour are listed.

Historical Cost Indexes: These indexes provide you with data to adjust construction costs over time. If you know costs for a project completed in the past, you can use these indexes to calculate a rough estimate of what it would cost to construct the same project today.

City Cost Indexes: Obviously, costs vary depending on the regional economy. You can adjust the "national average" costs in this book to 209 major cities throughout the U.S. and Canada by using the data in this section.

Abbreviations: A listing of the abbreviations used throughout this book, along with the terms they represent, is included.

Index

A comprehensive listing of all terms and subjects in this book to help you find what you need quickly when you are not sure where it falls in MasterFormat.

The Scope of This Book

This book is designed to be as comprehensive and as easy to use as possible. To that end we have made certain assumptions and limited its scope in three key ways:

1. We have established material prices based on a "national average."
2. We have computed labor costs based on a 30-city "national average" of union wage rates.
3. We have targeted the data for projects of a certain size range.

For a more detailed explanation of how the cost data is developed, see *How To Use the Book: The Details*.

Project Size

This book is aimed primarily at commercial and industrial projects costing \$500,000 and up. It is not for large multi-family or custom single family housing projects. Costs are primarily for new construction or major renovation of buildings rather than repairs or minor alterations.

With reasonable exercise of judgment the figures can be used for any building work. For civil engineering structures such as bridges, dams, etc., like, please refer to *Manual of Construction Cost Data*.

QUICK START

If you feel you are ready to use this book and don't think you need the detailed instructions that begin on the following page, this Quick Start section is for you.

These steps will allow you to get started estimating in a matter of minutes.

1 Find each cost data section you need in the Unit Price Section Table of Contents.

The cost data has been divided into 16 divisions according to the CSI MasterFormat.

2 Turn to the indicated section and locate the line item you need for your estimate. Portions of a sample page layout appear here.

- If there is a reference number listed at the beginning of a section, for example, R031-050, it refers to additional information you may find useful. See the Reference Section for detailed information.
- Note the crew code designation. You'll find full descriptions of crews in the Crews Section, including man-hour and equipment costs.

3 Determine the total number of units your job will require. Note that the unit of measure for the material you're using is listed under "UNIT."

- Bare Costs: These figures show unit costs for materials and installation. Labor and equipment costs are calculated according to crew costs and average daily output. Bare costs do not contain allowances for overhead, profit, or taxes.

- "Man-hours" allows you to calculate the total man-hours to complete that task. Just multiply the quantity of work by this figure for an estimate of activity duration.

4 Then multiply the total units by the "Total Incl. O&P," which stands for the total cost including the installing contractor's overhead and profit. (See the next pages for a complete explanation.)

- If the work is to be subcontracted, add the general contractor's markup, approximately 10%.

5 The price you calculate will be an estimate for a completed item of work.

6 Compile a list of all items included in the total project. Summarize cost information, and add project overhead.

For a more complete explanation of the way costs are derived, please see the following section.

Commonly Used Abbreviations

R.S. Means utilizes standard industry abbreviations. There is a complete glossary of abbreviations in the reference section. The following are a few of the most commonly used abbreviations you'll find in the book:

B.F.	Board Feet
C	Hundred; Centigrade
C.Y.	Cubic Yard (27 Cubic Feet)
Cwt	100 Pounds
Ea.	Each
Flr.	Floor
L.F.	Linear Foot
Lb.	Pound
MBF	Thousand Board Feet
Opng.	Opening
S.F.	Square Foot
SFCA	Square Foot Contact Area
S.Y.	Square Yard
Sq.	Square; 100 Square Feet
Sty.	Story
Surf.	Surface
V.L.F.	Vertical Linear Foot

Editors' Note: We urge you to spend time reading and understanding the supporting material. An accurate estimate requires experience, knowledge, and careful calculation. The more you know about how we at R.S. Means developed the data, the more accurate your estimate will be. In addition, it's important to take into consideration some of the reference material such as City Cost Indexes and the reference numbers.

031 | Concrete Formwork

031 100 Struct C.P. Formwork				UNIT PRICE DATA				TOTAL	
		CREW	QUANTITY	UNIT	UNIT PRICE	LABOR	MATERIAL	UNIT PRICE	QUANTITY
158	0010 FORMS IN PLACE, FOOTINGS Continuous wall, 1 use	C-1	375	.085	SFCA	1.36	1.30	.06	2.42
	0030 2 use		440	.073		.74	1.00	.07	2.50
	0100 3 use		470	.080		.54	1.39	.06	2.19
	0150 4 use		485	.086		.43	1.54	.06	2.03
	0500 Dowel supports for footings or beams, 1 use		500	.064	L.F.	.61	1.49	.06	2.16
	1000 Integral starter wall, to 4" high, 1 use		400	.080		1.15	1.86	.07	3.08
	5000 Spread footings, 1 use		305	.105	SFCA	1.61	2.44	.09	4.14
	5050 2 use		371	.086		.91	2.01	.08	3.00
	5100 3 use		401	.080		.68	1.86	.07	2.61
	5150 4 use		414	.077		.51	1.80	.07	2.38
	6000 Supports for dowels, plinths or templates, 2' x 2'		25	1.280	Ea.	2.97	.30	1.15	34.12
	6050 4' x 4' footing		22	1.455		6.40	.34	1.31	41.11
	6100 8' x 8' footing		20	1.600		1.7	.77	1.44	5.34

HOW TO USE THE BOOK: THE DETAILS

What's Behind the Numbers? The Development of Cost Data

The staff at R.S. Means continuously monitors developments in the construction industry in order to ensure reliable, thorough and up-to-date cost information.

While *overall* construction costs may vary relative to general economic conditions, price fluctuations within the industry are dependent upon many factors. Individual price variations may, in fact, be opposite to overall economic trends. Therefore, costs are continually monitored and complete updates are published yearly. Also, new items are frequently added in response to changes in materials and methods.

Costs — \$ (U.S.)

All costs represent U.S. national averages and are given in U.S. dollars. The Means City Cost Indexes can be used to adjust costs to a particular location. The City Cost Indexes for Canada can be used to adjust U.S. national averages to local costs in Canadian dollars.

Material Costs

The R.S. Means staff contacts manufacturers, dealers, distributors, and contractors all across the U.S. and Canada to determine national average material costs. If you have access to current material costs for your specific location, you may wish to make adjustments to reflect differences from the national average. Material costs do not include sales tax.

Labor Costs

Labor costs are based on the average of wage rates from 30 major U.S. cities. Rates are determined from labor union agreements or prevailing wages for construction trades for the current year. Rates along with overhead and profit markups are listed on the inside back cover of this book.

- If wage rates in your area vary from those used in this book, or if rate increases are expected within a given year, labor costs should be adjusted accordingly.

Labor costs reflect productivity based on actual working conditions. These figures include time spent during a normal workday on tasks other than actual installation, such as material receiving and handling, mobilization at site, site movement, breaks, and cleanup.

Productivity data is developed over an extended period so as not to be influenced by abnormal variations and reflects a typical average.

Equipment Costs

Equipment costs include not only rental costs, but also operating costs such as fuel, oil, and routine maintenance. Equipment and rental rates are obtained from industry sources throughout North America — contractors, suppliers, dealers, manufacturers, and distributors.

Crew Equipment Cost — The power equipment required for each crew is included in the crew cost. The daily cost for crew equipment is based on dividing the weekly bare rental rate by 5 (number of working days per week), and then adding the hourly operating cost times 8 (hours per day). This "Crew Equipment Cost" is listed in Subdivision 016.

General Conditions

Cost data in this book is presented in two ways: Bare Costs and Total Cost including O&P (Overhead and Profit). General Conditions, when applicable, should also be added to the Total Cost including O&P. The costs for General Conditions are listed in Division 1 and the Reference Section of this book. General Conditions for the *Installing Contractor* may range from 0% to 10% of the Total Cost including O&P. For the *General or Prime Contractor*, costs for General Conditions may range from 5% to 15% of the Total Cost including O&P with a figure of 10% as the most typical allowance.

Overhead and Profit

Total Cost including O&P for the *Installing Contractor* is shown in the last column on the Unit Price pages of this book. This figure is the sum of the bare material cost plus 10% for profit, the base labor cost plus total overhead and profit, and the bare equipment cost plus 10% for profit. Details for the calculation of Overhead and Profit on labor are shown on the inside back cover and in the Reference Section of this book. (See the "How To Use the Unit Price Pages" for an example of this calculation.)

Factors Affecting Costs

Costs can vary depending upon a number of variables. Here's how we have handled the main factors affecting costs

Quality — The prices for materials and the workmanship upon which productivity is based represent sound construction work. They are also in line with U.S. government specifications

Overtime – We have made no allowance for overtime. If you anticipate premium time or work beyond normal working hours, be sure to make an appropriate adjustment to your labor costs.

Productivity – The productivity, daily output, and man-hour figures for each line item are based on working an eight-hour day in daylight hours in moderate temperatures. For work that extends beyond normal work hours or is performed under adverse conditions, productivity may decrease. (See the section in "How To Use the Unit Price Pages" for more on productivity.)

Size of Project – The size, scope of work, and type of construction project will have a significant impact on cost.

Economies of scale can reduce costs for large projects. Unit costs can often run higher for small projects. Costs in this book are intended for the size and type of project as previously described in "How the Book Is Built: An Overview." Costs for projects of a significantly different size or type should be adjusted accordingly.

Location – Material prices in this book are for metropolitan areas. However, in dense urban areas, traffic and site storage limitations may increase costs. Beyond a 20-mile radius of large cities, extra trucking or transportation charges may also increase the material costs slightly. On the other hand, lower wage rates may be in effect. Be sure to consider both these factors when preparing an estimate, particularly if the job site is located in a central city or remote rural location.

In addition, highly specialized subcontract items may require travel and per diem expenses for mechanics.

Other factors –

- season of year
- contractor management
- weather conditions
- local union restrictions
- building code requirements
- availability of:
 - adequate energy
 - skilled labor
 - building materials
- owner's special requirements/restrictions
- safety requirements
- environmental considerations

Unpredictable Factors – General business conditions influence "in-place" costs of all items. Substitute materials and construction methods may have to be employed. These may affect the installed cost and/or life cycle costs. Such factors may be difficult to evaluate and cannot necessarily be predicted on the basis of the job's location in a particular section of the country. Thus, where these factors apply, you may find significant, but unavoidable cost variations for which you will have to apply a measure of judgment to your estimate.

Rounding of Costs

In general, all unit prices in excess of \$5.00 have been rounded to make them easier to use and still maintain adequate precision of the results. The rounding rules we have chosen are in the following table.

Prices from ...	Rounded to the nearest ...
\$.01 to \$5.00	\$.01
\$5.01 to \$20.00	\$.05
\$20.01 to \$100.00	\$.50
\$100.01 to \$300.00	\$ 1.00
\$300.01 to \$1,000.00	\$ 5.00
\$1,000.01 to \$10,000.00	\$25.00
\$10,000.01 to \$50,000.00	\$100.00
\$50,000.01 and above	\$500.00

Final Checklist

Estimating can be a straightforward process provided you remember the basics. Here's a checklist of some of the items you should remember to do before completing your estimate.

Did you remember to ...

- factor in the City Cost Index for your locale
- take into consideration which items have been marked up and by how much
- mark up the entire estimate sufficiently for your purposes
- read the background information on techniques and technical matters that could impact your project time span and cost
- include all components of your project in the final estimate
- double check your figures to be sure of your accuracy
- call R.S. Means if you have any questions about your estimate or the data you've found in our publications

Remember, R.S. Means stands behind its publications. If you have any questions about your estimate ... about the costs you've used from our books ... or even about the technical aspects of the job that may affect your estimate, feel free to call the R.S. Means editors at 1-617-585-7880.

171 | S.F., C.F. and % of Total Costs

171 000 S.F. & C.F. Costs			UNIT	UNIT COSTS			% OF TOTAL			
				1/4	MEDIAN	3/4	1/4	MEDIAN	3/4	
890	2900	Electrical	S.F.	5.45	7.45	10.30	8.50%	11.30%	13.20%	800
	3100	Total: Mechanical & Electrical	↓	12.20	18.55	25.95	20.30%	27.60%	34.70%	
	9000	Per pupil, total cost	Ea.	7,375	19,100	28,600				
830	0010	SPORTS ARENAS	S.F.	44.05	56.95	72.60				830
	0020	Total project costs	C.F.	2.45	4.48	5.65				
	2720	Plumbing	S.F.	2.31	3.97	7.10	4.30%	6.30%	8.50%	
	2770	Heating, ventilating, air conditioning	↓	4.80	6.70	8.70	5.80%	10.20%	13.50%	
	2900	Electrical	↓	3.73	6.25	7.70	7.10%	9.70%	12.20%	
	3100	Total: Mechanical & Electrical	↓	8.25	14.65	18.85	13.40%	22.50%	30.80%	
850	0010	SUPERMARKETS	S.F.	41.65	48.90	58				850
	0020	Total project costs	C.F.	2.30	2.76	3.99				
	2720	Plumbing	S.F.	2.24	2.94	3.45	5%	6%	6.90%	
	2770	Heating, ventilating, air conditioning	↓	3.43	4.09	5	8.50%	8.60%	9.50%	
	2900	Electrical	↓	4.86	5.95	7.25	10.20%	12.40%	13.50%	
	3100	Total: Mechanical & Electrical	↓	8.60	11.70	14.40	18.10%	22.40%	27.70%	
860	0010	SWIMMING POOLS	S.F.	75.30	90.25	158				860
	0020	Total project costs	C.F.	5.55	6.45	7.55				
	2720	Plumbing	S.F.	6.25	7.30	10.20	4.80%	9.60%	12.30%	
	2900	Electrical	↓	5.10	7.10	10.30	7.50%	7.80%	8%	
	3100	Total: Mechanical & Electrical	↓	11.15	23.40	43.35	17.70%	24.90%	31.60%	
870	0010	TELEPHONE EXCHANGES	S.F.	89.35	132	167				870
	0020	Total project costs	C.F.	5.55	8.55	12.35				
	2720	Plumbing	S.F.	3.18	5.45	8.05	3.50%	5.70%	6.60%	
	2770	Heating, ventilating, air conditioning	↓	7.70	17.70	22	11.70%	16%	18.40%	
	2900	Electrical	↓	8.40	14.45	26.15	10.70%	14%	17.80%	
	3100	Total: Mechanical & Electrical	↓	18.75	26.15	51.10	20.30%	30.80%	35%	
890	0010	TERMINALS Bus	S.F.	47.20	64.85	80.10				890
	0020	Total project costs	C.F.	2.05	3.71	4.57				
	2720	Plumbing	S.F.	1.39	3.12	4.80	2.30%	7.20%	8.80%	
	2900	Electrical	↓	2.15	4.90	8.25	7.50%	8%	11.80%	
	3100	Total: Mechanical & Electrical	↓	2.19	6.70	11.10	8.30%	16.90%	19.60%	
910	0010	THEATERS	S.F.	54.60	72.95	105				910
	0020	Total project costs	C.F.	2.62	3.86	5.70				
	2720	Plumbing	S.F.	1.76	2.04	6.15	2.90%	4.60%	6.10%	
	2770	Heating, ventilating, air conditioning	↓	4.89	6.60	7.55	7.30%	11.60%	13.30%	
	2900	Electrical	↓	4.94	6.65	12.95	8%	9.30%	12.20%	
	3100	Total: Mechanical & Electrical	↓	11.70	13.85	25.65	17.10%	24.90%	27.40%	
940	0010	TOWN HALLS City Halls & Municipal Buildings	S.F.	63.95	78.40	103				940
	0020	Total project costs	C.F.	4.34	6.75	9.65				
	2720	Plumbing	S.F.	2.24	4.39	7.65	4.20%	5.30%	9%	
	2770	Heating, ventilating, air conditioning	↓	4.75	9.45	10.80	7%	9%	12.20%	
	2900	Electrical	↓	5.05	7.50	10.70	7.90%	9.40%	15%	
	3100	Total: Mechanical & Electrical	↓	10.60	18.20	25.90	15.80%	22%	25.40%	
970	0010	WAREHOUSES And Storage Buildings	S.F.	23.10	32.55	50.50				970
	0020	Total project costs	C.F.	1.20	1.91	3.26				
	0100	Site work	S.F.	2.35	4.81	7.30	5.90%	12.50%	19.30%	
	0500	Masonry	↓	1.46	3.34	7.20	5%	7.10%	9%	
	1800	Equipment		.38	.79	4.61	.90%	2.40%	5.20%	
	2720	Plumbing	↓	.78	1.34	2.56	2.80%	4.10%	6.2%	
	2730	Heating, ventilating, air conditioning	↓	.89	2.31	3.34	2.40%	5%	7.2%	
	2900	Electrical	↓	1.40	2.62	4.31	4.90%	7.20%	9%	
	3100	Total: Mechanical & Electrical	↓	2.64	4.55	10	9.50%	15.40%	21.4%	

SQUARE FOOT 17

CITY COST INDEXES

DIVISION		FLORIDA																				
		FORT LAUDERDALE			JACKSONVILLE			MIAMI			ORLANDO			TALLAHASSEE			TAMPA					
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL			
2	SITE WORK	108.3	73.6	81.6	123.2	87.3	95.6	108.4	73.5	81.6	123.3	86.4	94.9	123.2	85.8	94.4	124.4	86.3	95.1			
031	CONCRETE FORMWORK	94.6	75.4	78.4	97.6	72.9	76.8	94.7	75.3	78.3	98.0	75.8	79.2	98.0	56.0	62.6	98.0	68.8	73.3			
032	CONCRETE REINFORCEMENT	93.3	77.5	84.4	93.3	70.2	80.3	93.3	77.4	84.3	93.3	80.9	86.3	93.3	69.5	79.9	93.3	79.3	85.4			
033	CAST IN PLACE CONCRETE	86.5	79.2	83.3	83.9	66.3	76.2	83.7	77.5	81.0	84.5	80.0	82.6	84.4	59.9	73.8	93.6	72.2	84.4			
3	CONCRETE	84.4	78.6	81.5	83.4	71.6	77.4	83.1	77.9	80.5	83.8	79.6	81.7	83.7	61.9	72.7	88.0	73.6	80.7			
4	MASONRY	78.8	76.2	77.2	78.7	68.2	72.2	74.8	74.4	74.5	75.5	80.0	78.3	80.4	55.7	65.0	79.4	70.9	74.1			
5	METALS	98.5	98.5	98.5	98.8	93.1	96.6	98.7	97.8	98.4	107.5	97.5	103.7	99.1	91.3	96.1	102.0	96.5	99.9			
6	WOOD & PLASTICS	90.4	77.2	83.9	96.4	74.5	85.6	90.4	77.2	83.9	96.4	75.5	86.1	96.4	54.8	75.9	96.4	69.3	83.0			
7	THERMAL & MOISTURE PROTECTION	96.5	77.7	87.7	96.7	74.7	86.4	99.7	78.5	89.8	96.7	79.6	88.7	96.7	60.5	79.8	96.7	66.4	82.6			
8	DOORS & WINDOWS	96.3	73.7	90.9	98.5	69.4	91.6	96.3	74.5	91.1	98.5	72.3	92.3	98.5	57.8	88.8	98.5	64.7	90.4			
092	LATH, PLASTER & GYPSUM BOARD	103.9	77.1	86.1	104.6	74.4	84.4	103.9	77.1	86.1	104.6	75.4	85.1	104.6	53.9	70.8	104.6	68.9	80.8			
095	ACOUSTICAL TREATMENT & WOOD FLOORING	98.1	77.1	84.6	98.1	74.4	82.8	98.1	77.1	84.6	98.1	75.4	83.5	98.1	53.9	69.6	98.1	68.9	79.3			
096	FLOORING & CARPET	111.9	82.7	105.1	111.9	67.9	101.6	120.4	79.9	110.9	111.9	79.5	104.3	111.9	52.8	98.1	111.9	71.9	102.6			
099	PAINTING & WALL COVERINGS	101.0	73.0	84.9	104.4	70.4	84.8	101.0	73.0	84.9	104.4	80.8	90.8	104.4	58.0	77.6	104.4	68.1	83.4			
9	FINISHES	105.2	76.3	90.5	107.2	71.7	89.2	108.0	75.7	91.6	107.2	77.0	91.8	107.2	55.0	80.6	107.2	69.2	87.9			
10-14	TOTAL DIV. 10-14	100.0	86.3	97.0	100.0	78.5	95.3	100.0	86.3	97.0	100.0	85.0	96.7	100.0	76.2	94.8	100.0	79.3	95.5			
15	MECHANICAL	100.1	76.4	89.8	100.1	67.7	86.0	100.1	76.3	89.8	100.1	72.9	88.3	100.1	57.8	81.7	100.1	72.4	88.1			
16	ELECTRICAL	97.3	91.1	93.1	97.3	67.3	77.4	97.3	88.7	91.6	97.3	65.8	76.3	97.3	60.9	73.1	96.8	71.1	79.7			
1-16	WEIGHTED AVERAGE	96.7	81.0	89.1	97.6	73.7	86.0	96.8	80.3	88.8	98.7	77.9	88.7	97.8	64.8	81.8	98.7	75.2	87.3			
DIVISION		GEORGIA																				
		ALBANY			ATLANTA			COLUMBUS			MACON			SAVANNAH			HONOLULU					
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL			
2	SITE WORK	108.4	74.9	82.6	111.8	94.2	98.2	108.4	75.0	82.8	110.0	92.8	96.8	108.7	76.8	84.2	115.9	111.2	112.3			
031	CONCRETE FORMWORK	97.5	54.6	61.2	97.9	74.9	78.5	97.5	54.1	60.8	96.5	70.8	74.8	97.6	64.9	70.0	101.4	158.0	149.2			
032	CONCRETE REINFORCEMENT	93.3	84.0	88.1	95.4	85.1	89.6	93.3	84.0	88.1	95.6	84.3	89.2	98.8	76.3	86.1	110.6	118.7	115.1			
033	CAST IN PLACE CONCRETE	87.1	51.1	71.5	95.0	74.0	85.9	87.6	51.8	72.0	91.6	55.8	76.0	83.9	59.2	73.2	175.7	121.0	152.0			
3	CONCRETE	84.8	60.9	72.7	89.4	76.6	82.9	85.1	60.9	72.9	87.1	69.6	78.3	84.1	66.7	75.3	155.6	135.5	145.4			
4	MASONRY	80.6	41.6	56.3	92.4	67.9	77.1	80.6	42.1	56.6	95.0	50.0	67.0	83.8	61.5	69.9	133.7	135.2	134.6			
5	METALS	96.7	93.4	95.4	95.7	78.4	89.0	96.6	93.7	95.5	91.7	94.6	92.8	96.9	91.9	95.0	117.4	105.1	112.6			
6	WOOD & PLASTICS	95.6	55.5	75.8	101.3	77.1	89.4	95.6	55.2	75.6	99.3	75.2	87.4	95.7	65.6	80.8	100.1	164.3	131.8			
7	THERMAL & MOISTURE PROTECTION	96.6	59.2	79.1	94.8	74.0	85.1	96.3	59.3	79.0	95.1	66.9	81.9	96.6	63.1	80.9	109.8	132.0	120.2			
8	DOORS & WINDOWS	96.3	57.8	87.1	94.8	73.4	89.7	96.3	57.9	87.1	94.6	69.8	88.7	96.3	61.0	87.9	103.9	144.4	113.6			
092	LATH, PLASTER & GYPSUM BOARD	104.6	54.7	71.4	111.2	77.0	88.4	104.6	54.3	71.1	107.9	75.0	86.0	104.6	65.1	78.3	96.4	166.4	143.0			
095	ACOUSTICAL TREATMENT & WOOD FLOORING	98.1	54.7	70.2	94.4	77.0	83.2	98.1	54.3	69.9	91.4	75.0	80.8	98.1	65.1	76.9	139.0	166.4	156.6			
096	FLOORING & CARPET	111.9	42.8	95.7	86.9	77.1	84.6	111.9	43.4	95.9	87.0	50.3	78.4	111.9	64.2	100.7	130.1	127.1	129.4			
099	PAINTING & WALL COVERINGS	101.0	53.1	73.3	100.7	75.9	86.4	101.0	50.9	72.0	102.6	62.1	79.2	101.0	63.0	79.1	125.6	145.2	136.9			
9	FINISHES	105.2	51.4	77.9	92.2	75.6	83.7	105.1	51.1	77.7	90.1	66.4	78.1	105.3	64.7	84.6	128.3	153.0	140.9			
10-14	TOTAL DIV. 10-14	100.0	70.9	93.7	100.0	77.1	95.0	100.0	70.8	93.7	100.0	75.3	94.6	100.0	73.7	94.3	100.0	132.5	107.1			
15	MECHANICAL	100.1	60.0	82.7	100.1	74.4	88.9	100.1	48.9	77.9	100.1	55.1	80.6	100.1	58.9	82.2	100.2	23.5	110.3			
16	ELECTRICAL	92.5	67.7	76.0	91.1	83.4	86.0	92.5	51.6	65.3	90.7	66.2	74.4	92.5	68.4	76.5	107.0	128.3	121.1			
1-16	WEIGHTED AVERAGE	96.3	63.3	80.4	95.8	78.1	87.3	96.3	58.6	78.1	94.8	68.9	82.3	96.5	68.0	82.7	115.8	129.3	122.3			
DIVISION		IDAHO																				
		BOISE			POCATELLO			CHICAGO			DECATUR			JOLIET			PEORIA					
		MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL	MAT.	INST.	TOTAL			
2	SITE WORK	86.9	100.6	97.5	89.8	100.6	98.2	84.3	91.9	90.1	81.9	95.2	92.1	84.3	91.4	89.8	90.9	94.8	93.9			
031	CONCRETE FORMWORK	96.7	87.0	88.5	96.6	87.0	88.5	106.7	123.1	120.5	101.8	88.3	90.4	106.6	121.0	118.8	99.5	91.8	93.0			
032	CONCRETE REINFORCEMENT	98.9	65.9	80.3	99.3	66.0	80.5	92.0	188.5	146.4	91.2	128.9	112.4	92.0	161.9	131.4	91.2	132.3	114.4			
033	CAST IN PLACE CONCRETE	98.2	89.5	94.4	100.3	89.6	95.6	99.5	124.9	110.5	92.4	92.7	92.5	99.5	124.1	110.2	92.4	100.9	96.1			
3	CONCRETE	103.5	83.8	93.5	104.5	83.9	94.1	90.9	135.0	113.2	85.9	98.2	92.1	90.9	128.8	110.0	88.8	103.3	94.6			
4	MASONRY	127.3	81.7	98.9	131.4	83.6	101.6	92.6	124.9	112.7	69.0	89.8	82.0	92.6	110.1	103.5	112.7	99.2	104.1			
5	METALS	114.0	78.4	100.2	113.6	78.6	100.1	97.4	128.9	109.5	95.4	112.9	102.2	95.7	118.1	104.3	98.4	116.3	103.4			
6	WOOD & PLASTICS	93.9	86.4	90.2	93.9	86.4	90.2	99.3	121.2	110.1	103.3	86.0	94.8	99.4	119.4	109.3	93.3	88.8	95.2			
7	THERMAL & MOISTURE PROTECTION	97.9	83.1	91.0	98.1	84.9	91.9	105.0	123.2	113.5	99.6	89.1	94.7	104.7	117.6	110.1	99.3	98.3	98.8			
8	DOORS & WINDOWS	96.0	76.0	91.2	96.0	74.5	90.9	108.7	137.4	115.6	100.6	105.0	101.7	108.6	130.5	111.9	98.6	98.8	100.2			
092	LATH, PLASTER & GYPSUM BOARD	87.9	85.6	86.4	87.9	85.6	86.4	93.3	121.4	112.0	96.9	85.2	89.1	90.7	119.6	110.2	98.0	88.0	89.6			
095	ACOUSTICAL TREATMENT & WOOD FLOORING	98.5	85.6	90.2	98.5	85.6	90.2	79.8	121.4	106.6	79.8	85.2	83.2	79.8	119.6	110.2	98.0	88.0	83.8			
096	FLOORING & CARPET	95.4	78.1	91.4	95.4	78.1	91.4	76.1	117.3	85.8	95.4	88.3	93.8	75.6	123.1	110.2	98.4	113.3	94.9			
099	PAINTING & WALL COVERINGS	108.0	63.6	82.4	108.0	80.6	92.2	67.9	119.6	97.8	77.8	87.4	83.4	65.5	102.3	110.2	98.0	110.2	86.7			
9	FINISHES	91.5	83.2	87.3	91.5	85.1	88.3	80.3	120.8	100.9	88.0	87.6	87.8	79.6	118.8	110.2	98.0	110.2	89.6			
10-14	TOTAL DIV. 10-14	100.0	84.3	96.6	100.0																	